

# BEST AVAILABLE COPY



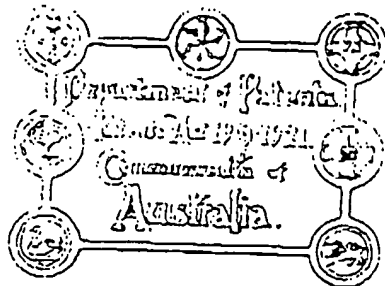
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This print shows the Specification as it became open to public inspection under Section 121 (5).

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Application Date : 24th Jan., 1939. No. 300/39.

Under International or Intercolonial Arrangements.  
(Union of South Africa, 18th February, 1938.)

Applicant .. .. MONTAGUE ERNEST GADD.  
Complete Specification .. .. Open to inspection (Sub-section 5, Section 121), 10th February, 1939.  
Application Lapsed (Sec. 48) .. .. Advertised, 15th August, 1940.

Classes 56.4 ; 00.4.  
Drawing attached.

## COMPLETE SPECIFICATION.

### "Improvements in or relating to spirit levels and the like."

I, MONTAGUE ERNEST GADD of Lifford, Grahamstown, Cape Province, Union of South Africa, Farmer, hereby declare this invention, and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention relates to improvements in spirit levels or the like levelling instruments. The object of the invention is to adapt a spirit level for the laying out of irrigation beds or furrows, building foundations or the like operations, in which the degree of accuracy obtainable with a scientific instrument such as a theodolite, or "Dumpy" level is not required.

According to the invention, a spirit or like level adaptable for levelling and like operations, consists of a stock having a bubble tube in its top side and is characterised in the provision of a horizontal longitudinal sighting hole running throughout the entire length of the stock, parallel

with said bubble tube, a vertical image-reflecting hole connecting the under side of the bubble tube to the sighting hole, and an inclined reflector positioned in such sighting hole beneath the underside of the bubble tube, in such a manner that, by looking through the sighting hole from the sighting end of the level, the image of the bubble is reflected through the image-reflecting hole on to the reflector, and from the reflector towards the sighting end, while the object sighted can be observed past the reflector.

The said longitudinal sighting hole is provided with stadia points or cross-hairs at or adjacent the end thereof remote from the sighting end. These are for the purpose of providing a definite centering or sighting point or line.

In one form which the invention may take, the inclined reflector is situated in the lower portion of the longitudinal sighting hole so as to permit sighting over its top edge. In a preferred construction, however,

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the inclined reflector is situated towards one side wall of the longitudinal sighting hole, so as to permit sighting past its inclined side edge. In the first mentioned construction

the sighting aperture at the sighting end of the sighting hole, is co-axial with the aperture at the opposite end of the stock. In the second construction, however, the sighting aperture, besides being substantially smaller than the aperture at the opposite end of the stock, is situated to one side of the axis of the sighting hole and substantially in line with the inclined side edge of the reflector.

In a modified construction of the instrument both the sighting end and the opposite end of the sighting hole are provided with glass lenses to increase the field of vision and to prevent dust collecting on the reflector. A further improvement resides in the provision of a suitable aperture in the stock of the level adjacent the reflector to facilitate cleaning thereof. The cross-hairs or stadia points in the last mentioned construction are conveniently marked or secured to the glass lenses.

In the preferred construction where the reflector is positioned towards one side of the horizontal sighting hole, its width is such that it obstructs approximately half the width of the sighting hole. This means that when sighting through the sighting aperture, the image of the bubble is constantly in view, while the object sighted can be observed past the inclined side edge of the reflector.

In order that the invention may be more clearly understood and carried into practice reference is now made to the accompanying drawings in which like reference numerals refer to like parts throughout the several views.

In the drawings:—

Fig. 1 is a pictorial view of the spirit level showing all the component parts inside the stock in broken lines.

Fig. 2 is a longitudinal cross-section of the intermediate portion of the spirit level.

Fig. 3 is a cross section on line III—III of Fig. 2.

Referring to the drawings numeral 1 denotes the stock of the spirit level having a bubble tube 2 secured in its top side. The bubble tube 2 is secured in the stock 1 by its ends while the said tube is protected by a metal plate 3 having a slot corresponding

with the centre of the bubble tube 2. The plate 3 is secured to the top side of the stock and may either cover part of the said side or its entire length.

The stock 1 is provided with a longitudinal sighting hole 4 which runs throughout its length, the axis of the said sighting hole being parallel with the bubble tube 2. The sighting hole is vertically connected to the underside of the bubble tube by means of a vertical hole 5 situated in the longitudinal sighting hole, immediately beneath the bubble tube and the vertical aperture 5 is an inclined reflector 6 secured to one side wall of the sighting hole. The image of the bubble is reflected from the tube 2, through aperture 5 on to the reflector 6 and from the reflector at right angles through the sighting half of the sighting hole 4 to the sighting or eye end 7 of the level. The width of the reflector 6 is about half the width of the sighting hole so that when sighting through the sighting aperture 8 which is situated on the opposite side of the vertical plane of the sighting hole, an unobstructed view is obtained.

Across the opening or aperture 9 of the sighting hole 4 at end 10 a stadia point or cross hair 11 is provided by means of which a definite centering or sighting point may be obtained.

An aperture 12 is provided in the bottom side of the stock 1 at the same angle as the reflector to facilitate cleaning of the reflector.

Having now fully described and ascertained my said invention, and the manner in which it is to be performed, I declare that what I claim is:—

1. An improved spirit or like level adaptable for levelling and like operations, consisting of a stock having a bubble tube in its top side, which is characterised in the provision of a horizontal longitudinal sighting hole running throughout the entire length of the stock parallel with said bubble tube, a vertical image-reflecting hole connecting the underside of the bubble tube to the sighting hole, and an inclined reflector positioned in said sighting hole beneath the underside of the bubble tube, in such a manner that, by looking through the sighting hole from the sighting end of the level, the image of the bubble is reflected through the image-reflecting hole onto the reflector, 55

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and from the reflector towards the sighting end, while the object sighted can be observed past the reflector.

2. An improved spirit or like level as claimed in Claim 1 in which the longitudinal sighting hole is provided with stadia points or cross-hairs at or adjacent the end remote from the sighting end.

3. An improved spirit or like level as claimed in Claims 1 and 2 in which the inclined reflector is situated in the lower portion of the longitudinal sighting hole so as to permit sighting over its top edge.

4. An improved spirit or like level as claimed in Claims 1 and 2 in which the inclined reflector is situated towards one side wall of the longitudinal sighting hole so as to permit sighting past its inclined side edge.

5. An improved spirit or like level as claimed in Claims 1, 2, and 3 in which the sighting aperture at the sighting end of the sighting hole is co-axial with the aperture at the opposite end.

6. An improved spirit or like level as claimed in Claims 1, 2, and 4 in which the sighting aperture at the sighting end of the

sighting hole is substantially smaller than the aperture at the opposite end, and is situated to one side of the horizontal axis of the sighting hole in line with the inclined side edge of the reflector.

7. An improved spirit or like level as claimed in the preceding claims, in which the sighting end and the opposite end of the sighting hole are provided with glass lenses to increase the field of vision and to prevent dust collecting on the reflector.

8. An improved spirit or like level as claimed in Claim 1, in which a suitable aperture is provided in the stock of the level adjacent the reflector to facilitate cleaning thereof.

9. An improved spirit or like level substantially as described with reference to the accompanying drawings.

Dated this 18th day of January, 1939.

MONTAGUE ERNEST GADD,

By his Patent Attorney,

P. M. BONNER.

Witness—J. Dennis.



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M. E. GADD

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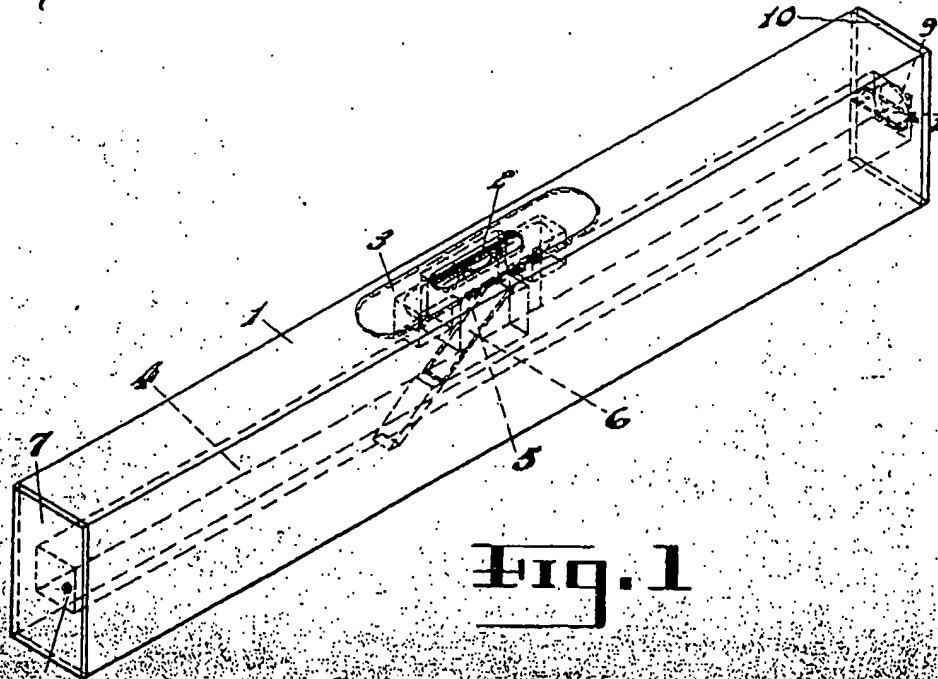


Fig. 1

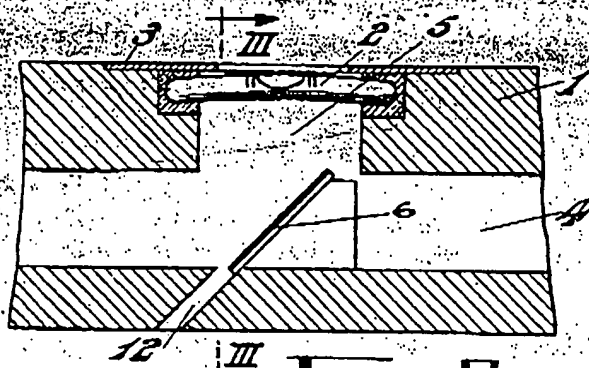


Fig. 2

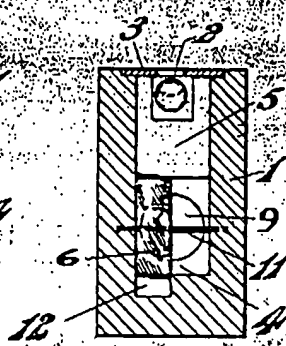


Fig. 3

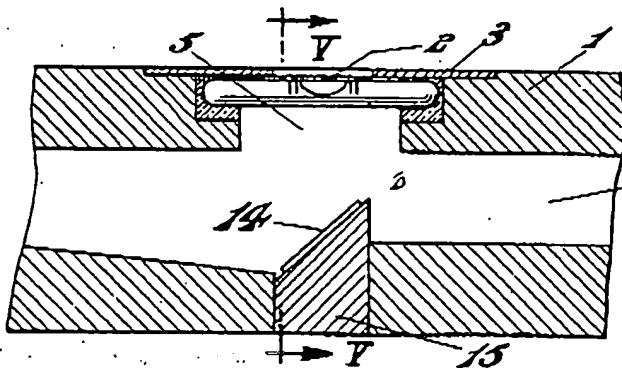


Fig. 4

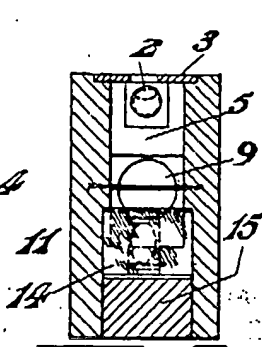


Fig. 5